

Japanese Patent Publication SHO No. 60-51654

Publication Date : November 15, 1985
Inventor : Terutane UCHIYAMA et al.
Application No. : SHO 55-70606
Date of filing : May 27, 1980
Name of Invention : A radiation thermometer

Description: Hereinafter, the invention is described in details with reference to the drawings.

Fig. 2 is a diagram showing a configuration of radiation thermometer embodying the invention. In Fig. 2, elements identical to those in Fig. 1 are indicated at the same reference numerals. Denoted at 27 is laser generator, a device of generating focusing light. Laser generator 27 is provided on an optical axis in parallel with the main optical axis. A laser beam emitted from laser generator 27 is reflected by reflection mirror 21 and introduced to the main optical axis, after reflected on a reflection surface of rotary sector 18. The thus introduced beam of light goes straight forward along the main optical axis via object lens 12 and irradiates onto a surface of steel piece 2 being fed by rolls 1. At this point, position of oscillator 10 is adjusted, while monitoring the surface on which the laser irradiates. This facilitates maneuvering of aligning the optical axis with the measurement point on the steel piece and enables accurate alignment.

It is desirable to use the laser beam lying in the visible region. The laser generator may be semiconductor laser, solid-type laser, gas laser, or equivalent. However, preferably in the embodiment of Fig. 2 in which the laser generator is built in the oscillator, a semiconductor laser is appropriate, considering the fact that laser generator of smaller size is required. Taking into account that laser generator generally requires a large power source, assembling the power source with a transducer makes handling of laser generator easy.

Fig. 3 is an external view of an alternate form of oscillator. In this figure, laser generator 28 is externally mounted to oscillator 10 via monitor window 23 by means of mounting member 29. In this case, laser generator 28 is mounted to oscillator 10 in

such a manner that the optical axis of light emitted from laser generator 28 be coincided with the optical axis of light monitored through eyepiece. Laser emitted from laser generator 28 is introduced to the main optical axis of oscillator 10 and irradiated onto the object whose temperature is to be measured through light receiving window 11. In this embodiment, laser generator 28 is mounted on the same level as monitor window 23, and laser is introduced to the main optical axis with the use of already existing optical axis. However, the arrangement is not limited to the above, but it may be possible to make an optical axis other than the already existing axis and to introduce laser emitted from laser generator to the main optical axis by reflection mirror, half-surfaced mirror (semitransparent mirror) and the like. Alternatively, it may be possible to introduce laser onto the main optical axis by utilizing optical fiber with the use of externally provided laser generator. In such case as the laser generator is provided externally, there is no constraints regarding the size of laser generator. Accordingly, any type of laser including solid-type laser and gas laser may be available.

It is to be noted that this invention is applicable to any device capable of emitting beam of light having a character of high convergence, other than laser generator.

As mentioned above, the inventive thermometer is advantageous in that there can be conducted accurate adjustment of optical axis relative to the object whose temperature is to be measured with easy operation.